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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,931	04/18/2006	Takaki Sugimoto	58924US006	3205
32692 7590 08/17/2009 3M INNOVATIVE PROPERTIES COMPANY PO BOX 33427 ST. PAUL, MN 55133-3427			EXAMINER BELL, WILLIAM P	
			ART UNIT 1791	PAPER NUMBER
			NOTIFICATION DATE 08/17/2009	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No. 10/561,931	Applicant(s) SUGIMOTO ET AL.	
	Examiner WILLIAM P. BELL	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 April 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-11 and 14-22 is/are pending in the application.
- 4a) Of the above claim(s) 11 and 14-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-11 and 19-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 January 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 8-10, and 19- 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morris (U.S. Patent No. 5,792,411) in view of Mitwalsky (U.S. Patent No. 5,843,363). Regarding claim 1, Morris teaches a master mold (see column 3, lines 49-56) which may be comprised of a variety of materials, including glass, ceramic, or metal materials (see column 4, lines 46-52). Morris further teaches that the master tool may be formed from a multi-layered substrate comprising a combination of materials in the layers (see column 5, lines 4-7). Morris teaches that the master tool is formed by laser ablation of the substrate using a mask, thereby imparting the desired microstructure to the substrate (see column 5, lines 14-39). Mitwalsky teaches a process for laser ablation (see column 2, lines 10-14) of a multi-layered structure comprising a metal layer covered by a ceramic material (see column 2, lines 55-60, wherein silicon nitride is a known ceramic material). Mitwalsky teaches that by having a metal layer underlying the ceramic layer, the depth to which the ablation process proceeds can be precisely limited provided that the energy density of the laser is lower than that required for ablation of the metal (see column 4, lines 34-37). As a result, the metal layer is exposed upon completion of the ablation process. Since the ceramic

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material can be ablated using a lower energy density than the metal, it must have a lower grinding speed. It would have been obvious to one of ordinary skill in the art at the time of the invention to have selected materials for the master mold taught by Morris consisting of a ceramic material on a metal layer, as taught by Mitwalsky, for the benefit of providing a configuration in which the depth of the ablation process and resulting microstructure could be controlled precisely and automatically without the need for end point detection systems (see Mitwalsky, column 4, lines 31-36).

Regarding claim 8, Morris teaches a master mold (see column 3, lines 49-56) which may be comprised of a variety of materials, including glass, ceramic, or metal materials (see column 4, lines 46-52). Morris further teaches that the master tool may be formed from a multi-layered substrate comprising a combination of materials in the layers (see column 5, lines 4-7). Morris teaches that the master tool is formed by laser ablation of the substrate using a mask, thereby imparting the desired microstructure to the substrate (see column 5, lines 14-39). Mitwalsky teaches a process for laser ablation (see column 2, lines 10-14) of a multi-layered structure comprising a metal layer covered by a ceramic material (see column 2, lines 55-60, wherein silicon nitride is a known ceramic material). Mitwalsky teaches that by having a metal layer underlying the ceramic layer, the depth to which the ablation process proceeds can be precisely limited provided that the energy density of the laser is lower than that required for ablation of the metal (see column 4, lines 34-37). As a result, the ceramic layer is selectively removed and the metal layer is exposed upon completion of the ablation process. Since the ceramic material can be ablated using a lower energy density than

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the metal, it must have a lower grinding speed. It would have been obvious to one of ordinary skill in the art at the time of the invention to have selected materials for the master mold taught by Morris consisting of a ceramic material on a metal layer, as taught by Mitwalsky, for the benefit of providing a configuration in which the depth of the ablation process and resulting microstructure could be controlled precisely and automatically without the need for end point detection systems (see Mitwalsky, column 4, lines 31-36).

Regarding claims 9 and 10, the recited processes for removing the high grinding speed material, specifically sandblasting and chemical etching, do not impart any structure to the master mold other than a fine structure pattern. Since the master mold taught by Morris, as modified by Mitwalsky, has such a fine structure pattern, the prior art also reads on these claims.

Regarding claims 19 and 21, Morris does not teach a master mold wherein the bottom portions of the fine structure pattern are flat. Mitwalsky teaches a structure wherein the bottoms of the fine structure pattern are flat (see Figure 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to have selected materials for the master mold taught by Morris consisting of a ceramic material on a metal layer, as taught by Mitwalsky, for the benefit of providing a configuration in which the depth of the ablation process and resulting microstructure could be controlled precisely and automatically without the need for end point detection systems (see Mitwalsky, column 4, lines 31-36).

Regarding claims 20 and 22, Morris teaches a master mold which may be a multi-layered structure comprised of a variety of materials, including ceramic and metal (see column 4, lines 46-52). Mitwalsky teaches forming a structure comprising a fine pattern wherein the pattern consists of ceramic and the bottom portions consist of a metal material (see column 2, lines 55-60, wherein silicon nitride is a known ceramic material). It would have been obvious to one of ordinary skill in the art at the time of the invention to have selected materials for the master mold taught by Morris consisting of a ceramic material on a metal layer, as taught by Mitwalsky, for the benefit of providing a configuration in which the depth of the ablation process and resulting microstructure could be controlled precisely and automatically without the need for end point detection systems (see Mitwalsky, column 4, lines 31-36).

3. Claims 4, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Morris and Mitwalsky as applied to claim 1 above, and further in view of Nakada (Japan Patent Application No. JP-10321126). Morris, as modified by Mitwalsky, does not teach a master mold suitable for making plasma display panel ribs or having a grid-like protrusion pattern. Nakada teaches a master mold comprised of metal (see [0033]-[0034] and Figure 2). Regarding claim 4, the master mold taught by Nakada is suitable for making plasma display panel ribs (see [0033]). Regarding claim 6, Nakada teaches that the master mold has a fine structure pattern that is a grid-like protrusion pattern comprising a plurality of ridge-like protrusions arranged substantially parallel while intersecting one another with predetermined gaps among them (see [0016] and Figure 7). Regarding claim 7, Nakada teaches a master mold wherein the

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fine structure pattern comprises ribs having a rib height of 150 to 300 μm , a rib pitch of 150 to 800 μm , and rib width of 50 to 80 μm (see [0008]). It would have been obvious to one of ordinary skill in the art at the time of the invention to have applied the mold and technique taught by Morris, as modified by Mitwalsky, to the production of a master mold for making plasma display panel ribs, as taught by Nakada, for the benefit of producing the master mold at high speed and significantly reduced cost (see Morris, column 11, lines 61-63).

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Morris and Mitwalsky as applied to claim 1 above, and further in view of Yang (U.S. Patent No. 6,382,254). Morris, as modified by Mitwalsky, does not teach a master mold suitable for making microfluidic articles. Yang teaches the manufacture of microfluidic articles using a master mold and the injection molding process (see column 3, line 64 through column 4, line 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to have applied the mold and technique taught by Morris, as modified by Mitwalsky, to the production of a master mold for making microfluidic devices, as taught by Yang, for the benefit of producing the master mold at high speed and significantly reduced cost (see Morris, column 11, lines 61-63).

Response to Arguments

5. Applicant's arguments with respect to claims 1 and 4-10 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM P. BELL whose telephone number is (571)270-7067. The examiner can normally be reached on Monday - Thursday, 8:00 am - 5:30 pm; Alternating Fridays, 8:00 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 571-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Wpb

/Richard Crispino/
Supervisory Patent Examiner, Art Unit 1791